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**CALFED ENVIRONMENTAL WATER ACCOUNT  
SHORT TERM COMPONENTS  
(OCTOBER 1, 2000 – SEPTEMBER 30, 2001)**

**FEDERAL WATER PURCHASE**

**Project Description:** Reclamation is pursuing south of the Delta water acquisitions from willing sellers who had already prepared environmental compliance documents covering the sale, storage, withdrawal, and conveyance of such water. The Kern Water Bank Authority (Authority) and Vidler Water Company (Vidler) submitted proposals to sell Reclamation a total of 106,000 acre-feet of their banked groundwater supplies under both one-time purchase and option arrangements. Both proposals were contingent upon an April 2000 State Water Project allocation of 50% or greater. Reclamation is presently finalizing a contract with the Authority to obtain an option for up to 100,000 acre-feet of this water until October 1, 2000. The cost to secure the option is \$30 per acre-foot. The cost to call on the option is \$100 per acre-foot. The Authority's water would be made available to Reclamation in O'Neill Forebay by having the Authority member districts utilize Kern Water Bank's banked groundwater resources instead of their Water Year 2000 State Water Project allocation.

**Project Benefits:** The benefit of acquiring south of the Delta water supplies for Environmental Water Account purposes is to mitigate water supply impacts associated with unforeseen Delta export curtailments needed to protect sensitive fish species.

**Project Costs:** Based on Reclamation's Water Year 2000 negotiations with the Authority and Vidler, the cost would be between \$130-\$200 per acre-foot. The low end of the range is based on a State Water Project April allocation of 100%. The high end is based on a State Water Project April allocation of 50%.

**Issues:** It will be necessary to determine if the Authority and Vidler will be a willing seller to the EWA. Additional environmental documentation would probably be required since Reclamation's environmental document did not discuss potential changes in Delta pumping as part of the proposed action.

**Linkages:** There might be an opportunity to carry Reclamation's Water Year 2000 option agreement with the Authority into Water Year 2001 solely for EWA purposes.

**Schedule:** Assuming willing sellers exist, obtaining the necessary environmental permitting requirements should be achievable prior to October 1, 2000.

**To do:** Assign responsibility for discussing EWA purchase with potential sellers. Traditionally, Reclamation has taken on this burden. It is unclear whether Reclamation has sufficient staffing resources to continue this role given their CVPIA water acquisition responsibilities.

**STATE WATER PURCHASE**

State water purchases from willing sellers for the Environmental Water Account can enhance protection to fisheries through improvement of in-stream flows or reduction in exports.

**Benefits**

State water purchases upstream of the Delta for the Environmental Water Account can provide a variety of benefits for anadromous fish including spawning, incubation, rearing, out-migration, and over-summering. Potential water supply benefits can be provided if upstream purchases are made available for export once they have completed providing in-stream benefits and reach the Delta. State water purchases south of the Delta for the Environmental Water Account can provide fishery benefits by reducing Delta exports during sensitive periods for fisheries by using purchased water to meet user demands in lieu of export pumping. Using water purchases south of the Delta to meet user demands can also provide an opportunity to address low-point concerns at San Luis Reservoir. The quantity of water available is dependant on hydrology and available funds. The projected \$10 million State funds could provide about 75 TAF of purchased water for the Environmental Water Account in Water Year 2001 (October 2000 – September 2001).

**Cost**

The cost to acquire groundwater is about \$130/AF to \$140/AF. An option for later purchase is estimated between \$30/AF to \$50/AF. The total subsequent cost to exercise the option and acquire the water would exceed the outright purchase price by about \$??/AF. Upstream water purchases may be available for costs of about \$50/AF.

**Issues**

Potential water right concerns for sellers making supplies available for purchase. Costs and source of funding are uncertain and impair the ability to make further progress. Available storage and conveyance influence the potential benefits that can be realized.

**Linkage**

The ability to convey and store the acquired water is essential for assuring and maximizing the benefits of a water acquisition program.

**Schedule/To do**

One-year purchases could potentially be arranged over a period of several months and could be coordinated well in advance for quick implementation as needed. Long-term purchase may require more extensive environmental documentation and will require long lead-times for completion of the documents.

Reinitiate discussions with south-of-Delta water sellers.  
Contact USBR regarding potential "215" water.  
Contact State Water Contractors regarding potential purchase of "reduced demand".  
Contact Yuba County Water Agency regarding potential water purchase.  
Contact upstream water users regarding potential water purchase.

## PURCHASE OF SAN JOAQUIN RIVER WATER

**Project Description:** The proposal would be to acquire through long-term purchase or option at least 100 TAF of water from the San Joaquin or its tributaries by: 1) pursuing those entities that are transferring water on the open market and establish long-term options (such as San Joaquin exchange contractors, SEWD, Merced River); 2) pursue tributary and main stem entities that may have water for sale and enter into long-term agreements (such as Merced and Tuolumne IDs, SEWD, Oakdale ID); 3) pursue the SJRGA and flexibility and or long-term arrangements for options on water that is dedicated to but may not be needed for VAMP.

**Benefits:** Acquiring long-term options and or contracts for stored water on the San Joaquin and its tributaries provides an EWA asset that could be used as an instream benefit and exported to storage to build up south of Delta EWA assets. It could be held and carried over in San Joaquin and Tributary reservoirs and released for export later in time after an export curtailment. It provides for a relatively accessible water supply for the EWA.

**Cost:** At minimum there could be 40 to 70 TAF annually that could potentially be available on the San Joaquin and its tributaries. Potentially in a year such as this there may be as much as 100 TAF or more available for purchase. Assuming Kern WB prices of \$135.00 an acre-foot, 100 TAF would be \$13.5 million.

**Issues:** Potentially San Joaquin River and tributary interests will not want to enter into long-term commitments. The dollar cost of the water and/or price for storage "rental" for carryover purposes could be expensive. San Joaquin River and tributary interests will likely want to see in-basin benefits from the purchase which could limit this water effectiveness as an EWA asset. The need to carryover purchased or option water in San Joaquin tributary reservoirs is a must and will be a difficult issue to resolve. Costs should be substantially less annually if there are long-term agreements because of a secure funding stream.

**Linkages:** Linkages that need to be considered include maximizing the use of this purchased water with other water purchases, ERP water, CVPIA water, and operations. If the purpose of this purchase is to move water south of the Delta to then carry it over, storage south of Delta such as San Luis or groundwater basins are necessary. There have been in recent years numerous purchases of water on the San Joaquin system for environmental purposes such as Merced River (12.5 TAF), SEWD on the Stanislaus (15 TAF), additional summer flows for steelhead on the Stanislaus (50 TAF). Also, Reclamation has moved forward on several environmental documents relating to transfers of water from San Joaquin Exchange or Friant contractors to other entities. This pool of transfer (market water) is another potential source. This year Reclamation has identified 47 TAF for purchase to potentially meet the VAMP flows. Modeling shows that potentially this purchase may not be needed for VAMP. There may be years that the 110 TAF identified as the maximum volume that the San Joaquin River Group Authority (SJRGA) has put towards the VAMP may not be needed. Both the 47 TAF and any water over and above that not needed for VAMP from the SJRGA are potential sources of water to purchase for the EWA.

**Schedule:** If this water were to be used to load 2001 EWA then acquisitions need to be pursued immediately. Some of the longer-term and more sensitive purchases and agreements, such as those with the SJRGA, should be pursued but will undoubtedly take longer. If the 47 TAF already identified for purchase to fulfill VAMP is not needed then CalFED should pursue that purchase as an installment on EWA.

**Next Steps:** Pull together all of the environmental documents that are being prepared for transfers and assignments and approach the selling entities to determine if they would be willing to sell to the EWA. Evaluation of the current 47 TAF identified for VAMP needs to be done to determine if it will be needed for VAMP. If the answer is no then it should be pursued with CalFED funds to purchase and carryover rights to subsequent years if it is not needed. Initial discussions should be pursued with SJRGA interests to determine 1) willingness to participate; 2) potential for long-term agreement; 3) magnitude of potential assets; 4) cost to purchase and/or store water; and 5) establish any limitations on the purchase. Potentially put out an RFP to enter into long-term agreements with San Joaquin and tributary interests for water and storage arrangements.

## DEMAND SHIFTING

Demand-shifting or rescheduling of water deliveries can enhance the real-time management of the system resulting in substantially less conflict between water-user needs and the environment. Funding through the Environmental Water Account to implement demand shifting can enhance protection to fisheries.

### Benefits

Demand-shifting of deliveries allows users south of the Delta to reduce deliveries during sensitive periods for fisheries. Demand-shifting also provides an opportunity to address low-point concerns at San Luis Reservoir. This measure could be used in a pro-active approach to advance water users with their supplies for subsequent reductions to enhance fishery protections during more sensitive periods. This measure does not produce any new water. The benefits are derived from shifting a potential quantity of available water on the order of 50 TAF to 100 TAF/year depending on hydrology and perceived risk (see Issues below).

### Cost

Demand shift arrangements will vary in cost depending on hydrology, carryover storage, payback period, and risk perceived by the contracting agency. It is reasonable to assume that south-of-Delta arrangements on the order of \$25/AF to \$75 /AF could be secured for short-term shifts. However, these costs could increase above \$100/AF depending on utilization of groundwater extraction facilities. An estimate of long-term shifts is \$??/AF.

### Issues

Two issues are the lead-time and risk necessary to obtain the full benefit of the potential demand shift. The lead-time to achieve the full potential quantity of demand shifting is dependant on the change in demand rate. A 100 cfs demand shift requires a full month to produce about 6 TAF, whereas, a 2,000 cfs demand shift provides nearly 120 TAF in the same time period. The desire to obtain as much of the potential shift benefit requires water users take some risk in advance of the actual need for such a measure. The risk they face is the uncertainty the water would be fully paid back. As a result, this management tool may be best suited for use on a limited basis in real-time management situations.

### Linkage

The availability of alternative local supplies, conveyance to and from those supplies, and the risks users are willing to accept influence the potential benefit of this measure.

### Schedule/To do

Short-term shifts could potentially be arranged over a period several months and could be coordinated well in advance for quick implementation as needed.

Contact Metropolitan Water District regarding potential participation.  
Contact Santa Clara Valley Water District regarding potential exchange with City and County of San Francisco or local groundwater.  
Contact Contra Costa Water District regarding potential shift using Los Vaqueros or local groundwater.  
Contact Central Valley Project and State Water Project agricultural contractors regarding shifting demands to local groundwater.

## INCREASING EXPORT/INFLOW RATIO

Modifying the export/inflow ratio as described in the Water Quality Control Plan provides an opportunity to shift diversions to assist the Environmental Water Account to enhance protection of fishery resources.

### Benefits

Relaxation of the export/inflow ratio would be allowed only when increased pumping would not harm fisheries, the Delta ecosystem, or water quality. Water derived from relaxing the export/inflow ratio for the Environmental Water Account would be used to curtail exports at a later date during sensitive periods for fisheries to increase fishery protection. This action does not increase total water supply since the increase in diversion capacity will be used to offset reductions taken in the spring or late fall during more sensitive periods for fisheries. The potential quantity of water available from relaxing the export/inflow ratio depends on hydrology and available export capacity at the State and federal facilities.

### Cost

The implementation costs are primarily the differential energy costs for shifting diversions during sensitive time periods for fisheries and potential costs to obtain alternative supplies during the reduced diversion period, if necessary.

### Issues

Increased diversions during the irrigation season could exacerbate water level conditions in the South Delta. The increased diversion would be subject to avoiding any potential fishery conflicts such as during high periods of Delta smelt salvage. Storage (surface or groundwater) is needed to place the additional pumping during the relaxation of the export/inflow ratio. Reduced diversions early in the season places a risk to the water users that the reduction could be recovered later in the year. Water quality could be affected if quality of water pumped is different than the pumping foregone.

### Linkage

Storage south of the Delta and conveyance to/from that supply influence the potential benefit of this measure. Available export capacity at the State and federal export facilities.

### Schedule/To do

Process is already in place, as described in the WQCP Table 3, footnote 22. The fishery agencies would recommend variations to export/inflow limit within the operations group. If there are no objections the action can be implemented immediately. The recommended actions require approval from CALFED Policy Group only if there is disagreement on the action. The SWRCB is notified of any variation; if the Executive Director does not object to the variation within 10 days, the variations will remain in effect.

## ADDITIONAL 500 CFS

Increasing the diversion rate into Clifton Court Forebay provides an opportunity to shift SWP diversions to assist the Environmental Water Account to enhance protection of fishery resources. This action does not increase total water supply since the increase in diversion capacity will be used to offset reductions taken in the spring or late fall during more sensitive periods for fisheries. The Department of Water Resources is in the process of pursuing a 500 cfs increase in cooperation with other agencies for 3 consecutive summer periods. An approach to increase the potential benefits would be to expand the period of this diversion flexibility and/or increase the quantity of the flexibility.

### Benefits

Increasing the allowable inflow to Clifton Court Forebay, increases the operational flexibility and protection of fishery resources. The increase in the allowable inflow reduces the potential risk to water users from reduction in diversions during sensitive periods for fisheries. The potential increased diversion in July and early August also provides an opportunity to address low-point concerns at San Luis Reservoir. This measure could be also be used in a pro-active approach to advance water users with their supplies for subsequent reductions in the late fall to enhance fishery protections during more sensitive periods. This measure does not produce any new water. The potential benefits derive from the ability to implement a maximum potential of up to 90 TAF/year, depending on hydrology, demand shift for the proposed 3 consecutive summer periods. An expanded time period can provide up to an additional 30 TAF/month and an increase above the 500 cfs can provide an additional increase depending on hydrology.

### Cost

Some dredging and local diversion infrastructure changes may be necessary to fully optimize the proposed diversion increase. The implementation costs are primarily the differential energy costs for shifting diversions during sensitive time periods for fisheries and costs to obtain alternative supplies during the reduced diversion period. There may be some conveyance costs for shifting of diversions for non-SWP users.

### Issues

Increased diversions during the irrigation season could exacerbate water level conditions in the South Delta. The increased diversion would be subject to avoiding any potential fishery conflicts such as during high periods of Delta smelt salvage. Reduced diversions early in the season places a risk to the water users that the reduction could be recovered later in the year. The maximum potential diversion shift of 90 TAF under the 3 consecutive summer proposal may be inadequate to fully recover any reduced diversions to enhance protection of fisheries and is subject to hydrological and other potential concerns including fishery.

### Linkage

The linkage for such diversion shifts is available storage and conveyance capacity to/from that storage to meet user demands during the reduced diversion period. Storage south of the Delta and conveyance to/from that supply influence the potential benefit of this measure.

### Schedule/To do

Continue DWR coordination with agencies for 3 consecutive summer period proposal. Consider expanded arrangement and coordinate with agencies on duration and quantity.

## B(2)/ ERP WATER RECOVERY FOR EWA

Description: Upstream b(2) releases might be captured, either upstream (via exchange) or in the export area (by direct pumping) and credited to the EWA account. ERP pulses might be captured, either upstream (via exchange) or in the export area (by direct pumping) and credited to the EWA account.

Benefits: EWA water stored upstream may be used to enhance instream flows, and might be exported to help fund export curtailments at another time. EWA water stored in the export area may be used to fund export curtailments and might be backed upstream to fund future instream flow enhancements. B(2) water potentially available might be as much as 200 kaf. ERP water potentially available might be as much as 100 kaf per year. However, practical considerations would reduce these volumes considerably. Analysis of game simulations might help to determine how much of the ERP releases could be recovered.

Cost: Costs should be minimal. This operation does not change overall pumping levels, merely the pattern of pumping.

### Issues:

- B(2) releases are already captured by the state and federal Projects to the best of their ability. Federal capture of b(2) is already credited toward other b(2) operations during the year. Therefore, transferring b(2) water captured by the federal Project would provide few new benefits. Credit for b(2) captured by the SWP is a controversial issue. DOI has sought such an arrangement and DWR has opposed it. Credit for b(2) captured by the state would be roughly equivalent to giving this water to the EWA and might be considered during negotiations over EWA assets.
- ERP upstream releases represent water potentially available to the EWA. However, the volume of ERP releases which the EWA could actually capture will be limited. ERP releases will be made primarily during the spring. At such time, export pumping will frequently be constrained, either by the USCOE criteria, the VAMP export limitations, or by discretionary EWA export curtailments. It may be possible to save the ERP releases upstream, if releases from tributaries upstream can be backed up into state or federal reservoirs. For example, higher releases on the Yuba River might allow releases from Oroville to drop. In this case, the increased storage could be given to the EWA as an asset.

Linkage: B(2) and ERP releases generally will require access to storage, whether upstream or in the export area to be useful.

Schedule: Negotiations over b(2) crediting are under way between DOI and DWR. Credits for ERP releases simply require agreement from USBR and DWR to credit water captured to the EWA.

To Do: Get status report on b(2) negotiations from USBR and DWR.

## RECAPTURE AND REUSE OF EWA, ERP, CVPIA b(2) WATER

**Project Description:** At times Interior may use b(2) water to meet instream flow needs, and ERP or EWA water may be obtained to meet flow needs. In some instances this water may not be needed to augment Delta flows; all or a portion of this water could be reused for environmental purposes. This water would be recaptured by the EWA in two ways: First, the EWA would have first priority to divert this water and store it south of Delta for later use. Second, if flow conditions permit, the water could be backed up into other upstream reservoirs, and could be released to provide additional instream flows and/or to be pumped south of the Delta when conditions allow.

**Benefits:** Acquisition of a sufficient quantity of water to allow for EWA export reductions will be problematic. This asset would provide a mechanism to use existing or acquired upstream water for multiple benefits. It would allow water for EWA to be acquired upstream of the Delta for instream flows, yet some of the water still could be used for south-of-Delta export reductions. The amount of EWA, ERP, and b(2) water which could be transported south of the Delta for re-use is difficult to determine because it will depend upon the timing of releases relative to available export windows. A conservative estimate would be that 5% of the ERP, EWA and b(2) water could be exported. At the beginning of Stage 1, this would amount to approximately 40-50 TAF per year.

**Cost:** There would be no cost to the EWA for acquisition of new water. Carriage water losses would apply. If water is backed up into other reservoirs, foregone power or storage costs may apply, depending upon where the water was stored. Would result in a loss of b(2) "windfall" water for the SWP.

**Issues:** Loss of "windfall" water for the State,

**Linkages:** Allows existing or acquired upstream water to be exported south of Delta for later use; thus linked closely with CVPIA b(2) and ERP acquisitions.

**Schedule:** If agreement, could come on-line at the beginning of next year.

**Next steps:** Determine through modeling and existing gaming information how much water could be obtained south of the Delta through this asset. Obtain agreement from State and Federal negotiators that this asset is worth pursuing. Determine what other steps are necessary to implement.

## SWP/CVP 400 CFS INTERTIE

1. **Asset:** Construct a 400 cfs intertie (designed for 600 cfs for redundancy) between the DMC and the California Aqueduct. Allows Tracy P.P. to pump at full capacity (4600 cfs) during months when normal operations limit capacity to 4200 cfs.
2. **Benefits:** 120 TAF maximum increased pumping per year based on 400 cfs/day for 5 months, November-March. Benefits may decrease as a result of other actions (see issues).
3. **Costs:** \$10 million estimated capital costs and \$1.5 million estimated annual O&M costs.
4. **Issues:** Yield of the asset will decrease in dry periods and when exports are constrained for environmental reasons. Sharing of the benefits will be a major issue that could be linked to payment of costs. If unlimited JPOD is granted, if the SWP and CVP are able to utilize 10,300 cfs Banks P.P. capacity, or if an intertie between Clifton Court Forebay and Tracy Pumping Plant is constructed, the water supply benefits of intertie decrease. Those benefits may decrease entirely if a combination of these actions occurs. South Delta water users may complain about exacerbated low water levels that they perceive to be caused by the increased pumping at Tracy. DWR may raise need to reconsider sharing under the COA.
5. **Linkage:** Because the increased pumping occurs during the San Luis Reservoir fill cycle, storage of the increased supply may be needed.
6. **Schedule:** Environmental documentation, ESA consultation, and design may take one year and construction would add another year.
7. **Next:** Examine probable benefits in light of other possible actions and explore the issue of sharing the costs and benefits.

## ACCESS TO EXPORT AND CONVEYANCE CAPACITY – JOINT POINT OF DIVERSION

**Description:** Access to Delta export capacity is essential for the EWA. Presently, DWR sometimes has unused capacity at the Banks Pumping Plant. DWR could agree to make Banks Pumping Plant capacity available to the EWA. However, the Bureau of Reclamation rarely has unused capacity at its Tracy Pumping Plant. Joint point of diversion (JPOD) could be the means by which the CVP contributes export capacity to the EWA. JPOD is the right for either the CVP or the SWP to use the others Delta pumping facilities, as limited by regulatory requirements. In practice, JPOD most often will be use of the Banks Pumping Plant by the CVP. D-1641 Stage 1 JPOD approval limits CVP use of JPOD to deliver water to a few specific CVP contractors, makeup for export reductions to help fish, and conduct a recirculation study, however, annual exports cannot be increased. D-1641 allows expanded use of JPOD for any permitted purpose including increasing water supply. This Stage 2 use is subject to the preparation and implementation of an operations plan acceptable to the Executive Director of the SWRCB that provides adequate protection to aquatic resources and other legal users of water, up to the limits in the current USCOE permit.

**Benefits:** Access to export capacity would enable the EWA either to move water to the export area in anticipation of future export curtailments or to repay the CVP or SWP for past export curtailments. Water could be pumped either pursuant to an agreement with DWR or using JPOD. The source of water being pumped could be 1) EWA-controlled water from upstream of the Delta, 2) surplus flows in the Delta, 3) CVPIA b(1)/b(2)/b(3) water or 4) ERP water purchased for upstream needs if not needed in the Delta.

A place to store EWA water south of the Delta would be needed. Possibilities include San Luis Reservoir, MWD's Diamond Valley Reservoir, or groundwater storage facilities. Storage for EWA is the subject of another issue paper. If the water being pumped is to compensate for prior export curtailments for fish, storage space is not needed.

Section III of the Department of Interior's 3406(b)(2) implementation criteria allows the transfer and storage of b(2) water (essentially converting b(2) water into EWA-type assets), provided that conveyance and storage capacity can be acquired. JPOD represents a possible means of transferring this water, assuming that storage can be found at SLR or elsewhere.

The Stage 2 approval allows JPOD to be used for any purpose permitted by the project's water right, but such use must be coupled with the development of an acceptable fish protection plan. This provision could be used to provide an expanded EWA asset. For example, the fish protection plan might stipulate that 50% of the water pumped through JPOD is EWA water and stored in SLR during the current winter without possibility of spilling. The other 50% could provide increased water deliveries to the CVP contractors.

**Cost:** Costs should be minimal. Viewed on a long enough time scale, use of Banks PP capacity for the EWA, either by agreement with DWR or as JPOD use per agreement with Reclamation, does not involve any net increase in total pumping.

### **Issues:**

- Priority for EWA use of Banks PP relative to other uses such as interruptible water supply and water transfers must be decided.

- Use of JPOD to make up for b(2) export impacts is controversial to environmental interests. However, use of JPOD to move b(2) water under Section III of the criteria is probably more acceptable.
- EWA use of JPOD to fill the unused share of CVP storage in SLR may limit SWP use of this storage. SWP contractors could object.
- Sharing JPOD capacity with the EWA may be objectionable to CVP contractors.

**Linkage:** EWA water is most useful when it is available in the export service area. This requires access to south-of-Delta storage capacity. SLR may provide some storage, however other storage capacity will be needed. Coordination with ERP and CVPIA water management is essential.

**Schedule:** The Stage 1 use of JPOD approved in D-1641 requires consultation with the fishery agencies and submittal by Reclamation of agreements on the proposed coordinated operation and documentation that no additional water will be exported. Consultation can be accomplished via the CALFED Operations Group. JPOD has not yet been used pursuant to D-1641 authorization. The Stage 2 JPOD requires agreement among USBR, DWR, USFWS, NMFS, and DFG; monitoring of environmental conditions, fish abundance and fish entrainment; and other operating criteria to avoid upstream impacts. Agreements for Stage 1 or 2 of JPOD probably could be completed within a few months.

Diversion of EWA water at Banks PP by DWR could be accomplished by agreement with DWR.

**To Do:** Seek agreement for DWR diversion of water for the EWA. Seek approval to use unused CVP SLR storage (Snow, Macaulay). Complete agreement among agencies on Stage 1 use of JPOD. Begin discussions on equitable division of Stage 2 JPOD and complete necessary agreements to satisfy fishery agencies and SWRCB. Provide certainty that required monitoring and reporting needed to satisfy SWRCB requirements for JPOD use and to support EWA decisions are adequately funded.

## SAN LUIS STORAGE

**Project Description:** The proposal here is to dedicate and fill at least 100 TAF of San Luis Storage to EWA purposes by utilizing either 1) unused CVP share of San Luis Reservoir; 2) dedicate outright a share of San Luis Reservoir; or 3) set up a wheeling/sharing arrangement for a dedicated share of San Luis. This arrangement would be for a limited amount of time (3-5 years) until long-term arrangements could be made with other south of Delta storage reservoirs or groundwater banks to dedicate storage to EWA assets.

**Benefits:** Through the EWA gaming exercises it was generally recognized that use of existing storage facilities south of the Delta were necessary to make the EWA work effectively. The gaming exercises relied on San Luis storage heavily to provide quick and ready water to support the EWA. San Luis, if it is filled early, would provide a hedge against actions that may be taken to protect fish. Typically it has been the position of CVP and SWP operators that San Luis storage cannot be dedicated to environmental purposes. If storage was dedicated, then water for environmental purposes would be vacated first if there were a conflict with contractual obligations. San Luis storage provides for relatively inexpensive insurance for the EWA. In order to make an EWA work the EWA manager will want to use the cheapest and most readily refillable EWA assets first. If San Luis were not used in the short-term the EWA would be forced to use off-stream storage reservoirs, potentially non-project, or groundwater resources which will be very expensive. With the use of some of the near-term conveyance options such as the 500 cfs summer exports or the intertie, it becomes easier to refill San Luis.

**Cost:** This proposal would result in 100 TAF of dedicated storage to EWA purposes. Much of this storage in many years goes unused because of the CVP inability to move water into storage. There may be a dollar cost associated with pumping costs and/or carryover considerations.

**Issues:** There may be legal and contractual issues associated with dedicating San Luis for EWA purposes. If San Luis were to fill through normal operations the issue of whether EWA water gets vacated to fulfill contractual needs would need to be resolved. The institutional arrangements and criteria for transferring San Luis storage to other areas would be part of the assurances package. Issue of whether the storage is available or filled at day one will probably need to be resolved.

**Linkages:** The linkage to water acquisitions, the 400 cfs intertie, sharing of new conveyance capacity are all necessary to maximize the efficiency of the EWA with south of Delta storage, generally, and San Luis specifically because of its role in meeting other project purposes. Additionally, this storage could be linked to San Joaquin River purchases. There are potential linkages to JPOD and turnback pool water as potential sources to fill this storage.

**Schedule:** This is an arrangement which could be instituted on the day the ROD is signed creating an instant deposit in the EWA of 100 TAF.

**Next Steps:** There is a need to investigate what the legal and institutional constraints may be on this arrangement and if 100 TAF could be made available for approximately 3-5 years until other EWA resources became available.

## LEASE SOUTHERN STORAGE

Leasing of storage south of the Delta for the Environmental Water Account can provide temporary storage until assets for EWA can be acquired on a permanent basis. Acquiring storage south of the Delta is necessary to make the EWA work effectively.

### Benefits

Leasing storage south of the Delta for the Environmental Water Account improves the effectiveness of the EWA for enhancing protection to fisheries. Other benefits include protection of existing water supplies projects. This action does not increase total water supply since the increase in storage capacity will be used to offset reductions taken in the spring or late fall during more sensitive periods for fisheries. The potential quantity of storage capacity available is dependant on what quantity of storage owners are willing to lease to EWA considering risks to their water supply.

### Cost

The costs will be dependant on the costs of leasing the storage space, the water needed to fill the space, and the costs of conveying the water. The costs will be greater as the distance from the Delta increases due to conveyance costs.

### Issues

The key operational restrictions include availability of water to be stored and conveyance capacity to the facility. The EWA may need to acquire water rights to store water for environmental purposes.

### Linkage

Conveyance capacity at the State and federal export facilities and into and out of the storage facility are key to its effectiveness.

### Schedule/To do

Initiate discussions with existing south of Delta storage owners such as the Metropolitan Water District that are currently, or in the past, have offered to lease storage space. Developing contracts, addressing third party impacts, applying for SWRCB and local permits, and complying with CEQA/NEPA requirements.

## GROUNDWATER STORAGE

Groundwater banking is a form of conjunctive use that involves the storage of surplus or wet-year water in groundwater basins that have existing storage space which can be assigned for Environmental Water Account purposes.

### Benefits

The primary benefit of groundwater banking for the Environmental Water Account is additional storage to the system. Added storage can be used to improve system flexibility and enhance opportunities to protect fisheries. Other benefits include improved groundwater basin management, protection of existing water supplies projects, and opportunities to create wetland habitat and other environmental benefits. This action does not increase total water supply since the increase in storage capacity will be used to offset reductions taken in the spring or late fall during more sensitive periods for fisheries. The potential quantity of storage capacity available is ???AF.

### Cost

Groundwater banking costs will vary with the infrastructure required to operate the project. Some projects will utilize spreading basins, while others may use injection wells. In lieu projects, where surface water is provided so that groundwater pumping could be reduced, will also be considered. Additional infrastructure could include conveyance facilities, diversions, pump stations, filtration plants, and extraction wells. In general, cost estimates for groundwater banking projects can range from \$100 to \$400 per acre-foot. Costs to lease storage have previously been identified as \$270/AF.

### Issues

The key operational restrictions include availability of water to be banked, recharge rates, land availability for spreading basins, and extraction rates. Improperly managed groundwater banking projects can result in third-party impacts, including changes in water table elevations, water quality degradation, and subsidence. SWRCB temporary change in place of use permits, pursuant to Water Code Section 1725, may be required. Additionally, many counties have adopted ordinances that require permits for exportation of groundwater.

### Linkage

Conveyance capacity at the State and federal export facilities and into and out of the groundwater storage facility are key to its effectiveness.

### Schedule/To do

Developing a contract between banking partners, addressing third party impacts, applying for SWRCB and local permits, complying with CEQA/NEPA. Initiate discussions with existing groundwater banking programs such as the Semitropic and Kern water banks which are currently, or in the past, have offered to lease storage space.